

WHAT IS CLAIMED IS:

1. A particle beam therapy system comprising:
a charged particle beam generator for emitting a charged particle beam;
a plurality of treatment rooms in each of which an irradiation unit for irradiating the charged particle beam is disposed;
a plurality of beam transport systems communicated with said charged particle beam generator and transporting the charged particle beam emitted from said charged particle beam generator separately to said respective irradiation units in said plurality of treatment rooms; and
a first shutter provided in at least one of said beam transport systems and shutting off a beam path in the relevant beam transport system.

2. A particle beam therapy system comprising:
a charged particle beam generator for emitting a charged particle beam;
a plurality of treatment rooms in each of which an irradiation unit for irradiating the charged particle beam is disposed;
a first beam transport system connected to said charged particle beam generator and transporting the charged particle beam emitted from said charged particle beam generator;
a plurality of second beam transport systems provided

respectively corresponding to said treatment rooms, connected to said first beam transport system, and transporting the charged particle beam transported through said first beam transport system to the corresponding irradiation units mounted to rotating gantries disposed in said treatment rooms;

a path switching device disposed at each of junctions between a beam path in said first beam transport system and beam paths in said plurality of second beam transport systems, and switching the beam path in which the charged particle beam is introduced; and

a plurality of first shutters provided respectively in said plurality of second beam transport systems downstream of said path switching devices in the direction of advance of the charged particle beam, and shutting off the beam path in the corresponding second beam transport system.

3. A particle beam therapy system according to Claim 2, further comprising a shutter controller for controlling said first shutter to be open, which is provided in the second beam transport system introducing the charged particle beam to selected one of said plurality of treatment rooms.

4. A particle beam therapy system according to Claim 3, wherein said shutter controller does not control said first shutter to be open, which is provided in each of the other second beam transport systems not introducing the charged particle beam than the second beam transport system

introducing the charged particle beam to the selected treatment room.

5. A particle beam therapy system according to Claim 3, further comprising a selected-treatment-room information output device for outputting selected-treatment-room information representing the selected treatment room to said shutter controller.

6. A particle beam therapy system according to Claim 5, wherein said shutter controller executes first control for bringing all said first shutters provided in all said second beam transport systems into a closed state, and second control for bringing the first shutter into an open state, which is provided in the second beam transport system introducing the charged particle beam to the selected treatment room, by using said selected-treatment-room information.

7. A particle beam therapy system according to Claim 3, wherein said shutter controller executes first control for bringing all said first shutters provided in all said second beam transport systems into a closed state, and second control for bringing the first shutter into an open state, which is provided in the second beam transport system introducing the charged particle beam to the selected treatment room.

8. A particle beam therapy system according to Claim 3, wherein said irradiation units disposed in said plurality of treatment rooms are each provided with a dose detector for detecting radiation dose produced by the charged particle beam, and said shutter controller controls the open first shutter into a closed state when the radiation dose detected by the dose detector provided in the selected treatment room reaches a dose setting value.

9. A particle beam therapy system according to Claim 3, wherein said shutter controller controls the open first shutter into a closed state when irradiation of the charged particle beam by said irradiation unit disposed in the selected treatment room is completed.

10. A particle beam therapy system according to Claim 2, further comprising a second shutter which is provided in said first beam transport system at a position between said charged particle beam generator and the beam transport system junction closest to said charged particle beam generator, and which shuts off the beam path in said first beam transport system.

11. A particle beam therapy system according to Claim 10, wherein said second shutter is lighter than said first shutter.

12. A particle beam therapy system according to Claim

10, further comprising a shutter controller for controlling the first shutter into an open state, which is provided in the second beam transport system introducing the charged particle beam to the selected treatment room, and thereafter controlling said second shutter into an open state.

13. A particle beam therapy system according to Claim 10, further comprising a shutter controller for controlling the first shutter into an open state, which is provided in the second beam transport system introducing the charged particle beam to selected one of said plurality of treatment rooms, and thereafter controlling said second shutter into an open state.

14. A particle beam therapy system according to Claim 2, wherein said path switching device is a switching electromagnet.

15. A particle beam irradiating method comprising the steps of:

when transporting a charged particle beam emitted from a charged particle beam generator to an irradiation unit in selected one of a plurality of treatment rooms, opening a shutter provided in a beam path for introducing the charged particle beam to said irradiation unit in the selected treatment room, thereby transporting the charged particle beam; and

irradiating the charged particle beam having reached

said irradiation unit in the selected treatment room to a patient present in the selected treatment room.

16. A particle beam irradiating method according to Claim 15, wherein the irradiation of the charged particle beam to said patient is performed in a state in which shutters provided in the beam paths extended into the other treatment rooms than the selected treatment room are closed.

17. A particle beam therapy system comprising:
a charged particle beam generator for emitting a charged particle beam;

a plurality of treatment rooms in each of which an irradiation unit for irradiating the charged particle beam is disposed;

a charged particle beam transport apparatus having a plurality of beam paths, communicated with said charged particle beam generator, and transporting the charged particle beam emitted from said charged particle beam generator separately to said respective irradiation units in said plurality of treatment rooms; and

a plurality of element groups;

said plurality of element groups being successively arranged in said beam paths in the direction in which the charged particle beam advances through said beam paths, and said element groups including respective elements disposed in said plurality of beam paths,

said element groups being each provided with an

alternatively selecting device for alternatively selecting the respective elements in said element groups.

18. A particle beam therapy system comprising:
a charged particle beam generator for emitting a charged particle beam;
a plurality of treatment rooms in each of which an irradiation unit for irradiating the charged particle beam is disposed;
a charged particle beam transport apparatus having a plurality of beam paths, communicated with said charged particle beam generator, and transporting the charged particle beam emitted from said charged particle beam generator separately to said respective irradiation units in said plurality of treatment rooms;
a plurality of element groups each having a plurality of elements; and
said element groups being disposed in said plurality of beam paths in a one-to-one relation, and said plurality of elements in each of said element groups being successively arranged in the corresponding beam path in the direction of advance of the charged particle beam;
an alternatively selecting device for alternatively selecting any one of said element groups.

19. A particle beam therapy system according to Claim 17, wherein said alternatively selecting device connects the respective elements in said element groups to a common power

supply in an alternative manner.

20. A particle beam therapy system according to Claim 18, wherein said alternatively selecting device connects the plurality of elements, which are electrically connected in series in each of said element groups, to a common power supply in an alternative manner.

21. A particle beam therapy system according to Claim 17, wherein said alternatively selecting device is a mechanical switch.

22. A particle beam therapy system according to Claim 18, wherein said alternatively selecting device is a mechanical switch.

23. A particle beam therapy system according to Claim 19, wherein said alternatively selecting device is a mechanical switch.

24. A particle beam therapy system according to Claim 19, wherein at least one of said element groups has the plurality of elements arranged along one of said beam paths and electrically connected in series.

25. A particle beam therapy system according to Claim 19, wherein said elements are electromagnets.

26. A particle beam therapy system according to Claim 19, wherein each element in one of said element groups is a path switching electromagnet for introducing the charged particle beam to corresponding each beam path.

27. A particle beam therapy system according to Claim 19, wherein each element in one of said element groups includes a shutter provided in corresponding each beam path and shutting off the beam path, and a shutter driver for independently driving the shutter.

28. A particle beam irradiating method comprising the steps of causing a plurality patients to enter a plurality of treatment rooms, respectively, and selectively introducing a charged particle beam emitted from a charged particle beam generator to irradiation units disposed in said treatment rooms for irradiation to the patients in sequence, the irradiating method comprising the steps of:

electromagnet groups disposed in a one-to-one relation to a plurality of beam transport paths extended from said charged particle beam generator to said irradiation units in said plurality of treatment rooms;

forming no beam transport paths when electric power from a power supply is supplied to plural ones of said electromagnet groups; and

when electric power from said power supply is supplied to only one of said electromagnet groups, forming one corresponding beam transport path and irradiating the

charged particle beam to the patient by the irradiation unit in the corresponding treatment room through the formed beam transport path.